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REVIEW

Failed first trimester surgical termination of pregnancies – A review

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ABSTRACT

The incidence of failed surgical termination of pregnancy (sTOP) in the first trimester is about 2 per 1000 procedures. It is associated with major embarrassment and potential medicolegal consequences. The risk factors for failed abortions are uterine anomalies, early gestation, nulliparity, operator inexperience, non-use of pre-operative cervical dilator, and use of inappropriately small-sized suction cannulas during the procedure. Strategies for prevention of failed sTOP include routine preoperative ultrasound scans, training and accreditation of operators, scheduling of sTOP between 7 to 12 weeks gestation, use of pre-operative cervical priming, routine examination of the aspirated tissue, and availability of senior operator and ultrasound scan facilities for difficult cases. Early recognition of a failed termination is essential to reduce the consequences of this complication. Adequate counseling should be provided. Termination of pregnancy by prostaglandins or a repeat surgical procedure should be offered.

Keywords: Failed termination of pregnancy, abortion, continued pregnancy, first trimester, surgical, strategies, review

INTRODUCTION

Failed surgical termination of pregnancy (sTOP) in the first trimester can be defined as continued pregnancy after a surgical procedure to terminate the pregnancy before 12 completed weeks of gestation. Earlier reported rates range from of 0.71 to 2.3 per 1000 procedures[1,2]. An improved failed sTOP rate from 0.7 to 0.25 per 1000 was reported following the routine incorporation of simple flotation studies immediately post-operatively to detect products of conception[3]. These studies were published in the late 1970s to mid 1980s, with a paucity of studies on this area. In 1996, an unimpressive failure rate of 1.8 per 1000 was reported[4]. Though this is an uncommon complication of a sTOP, it can cause major embarrassment with potential medicolegal consequences.

To reduce the incidence rates and consequences of failed sTOP, it is important to have a good understanding of the risk factors for failed sTOP, the strategies that can be implemented to prevent this, and the early detection and subsequent management of failed sTOPs.

RISK FACTORS FOR FAILED TERMINATION OF PREGNANCY

These risk factors can be classified into patient characteristics, and operator and technical characteristics.

Patient characteristics

1. *Uterine anomalies*

   Congenital uterine anomalies (especially bicornuate uterus[5,6,7], uterus didelphys[7] and septate uterus[8]) is the strongest risk factor for failed sTOP, with a relative risk of 90.6 or a prevalence of 20%[2]. The difficulty in surgically removing a gestational sac

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situated in an anomalous uterus is easily appreciated. The definitive diagnosis of such anomalies by ultrasound scan is difficult as well. With a prevalence of about 4.3% in the general population[9], cost-effective measures for the routine screening of such anomalies before sTOP do not exist. Such congenital uterine anomalies are usually diagnosed after the diagnosis of failed sTOP. A high index of suspicion may allow the pre-operative diagnosis of some cases when the history is suggestive e.g. recurrent miscarriages, cervical incompetence, or failed contraception despite the presence of an intrauterine contraceptive device in a seemingly correct position.

Uterine malpositions such as acute anteversion and retroversion have been implicated in failed sTOP[4]. They present difficulty in surgical dilatation prior to suction curettage, and may result in cervical or uterine perforation which would detrimentally affect the completion of the surgical procedure.

Uterine fibroids have been also been implicated in failed sTOP[4]. However there is inadequate evidence to support this as the incidence of uterine fibroids in failed sTOP has not been shown to be higher than that in successful sTOP. Uterine fibroids are common in women of reproductive age, and their implication in failed sTOP is probably more a reflection of their common occurrences rather than fibroids being a risk factor for failed sTOP.

2. *Gestation*

Early surgical abortion at 4 to 6+6 weeks gestation, despite the use of specially designed rigid or flexible cannulas, was associated with rates of failed abortion ranging from 0.95 to 6.4%[10,11]. Pregnancies at less than or equal to 6 weeks gestation were associated with a higher risk of failed sTOP than pregnancies between 7 to 12 weeks gestation[2].

3. *Previous pregnancy history – gravidity and parity*

Most case series and reports indicated a higher incidence of failed abortions among nulliparous. This is consistent with practical experience when variable difficulty may be encounterd in the surgical dilatation of the cervix, especially without the use of cervical ripening agents. There was, however, a report of higher failed surgical terminations in women with previous pregnancies than nulliparas by a relative risk factor 2.2[2]. This finding is not well accepted by others.

Technical and operator characteristics

1. *Operative inexperience*

Like all operations, operator inexperience has been linked with higher complication rates in termination of pregnancies, including failed abortion. It has been shown that residents (our local equivalent of medical officers and registrars) has a higher rate of failed abortion than attending physicians (our local equivalent of associate consultants, consultants and senior consultants)[2].

2. *Use of pre-operative ripening agent*

Pre-operative cervical dilatation with laminaria tents has been associated with a decreased rate of failed sTOP[2]. Pre-operative cervical priming with prostaglandins can be expected to show similar association with failed sTOP, although no direct evidence exists to support this. Pre-operative prostaglandin increases cervical dilation to a mean of 6 mm, with easy passability of a 7 to 8 mm Hegar surgical dilator with little force[12].

3. *Size of suction cannula*

Use of cannula with diameter of 5 mm or less in pregnancies less than or equal to 6 weeks of gestation is associated with a higher risk of failed abortions with a relative risk factor of 11.1[2]. The use of cannulas with diameters less than the number of weeks of gestation for pregnancies between 7 to 12 weeks is, however, not associated with higher risk of failed sTOP[2].

Strategies for prevention of a failed sTOP, and its consequences

Pre-operative measures

Routine ultrasound scan

A transabdominal and/or transvaginal ultrasound scan before scheduling the patient for termination of pregnancy is useful, and indeed is routine in many institutions. The main reasons for a routine ultrasound scan are to allow accurate localization of the site of pregnancy (intrauterine vs ectopic), determination of viability and dating of the pregnancy within a few minutes by a sonographer with basic training. Occasionally, coincident uterine anomalies like bicornuate uterus and uterus didelphys may be suspected by experienced sonographers (with reported sensitivity rates of 70%[13]), though definitive differentiation of types of uterine anomalies would often require other imaging modalities.

Opponents of such a policy argue that there is no evidence to support the cost-effectiveness of such an implementation. However, incorporation of such a policy in an existing ultrasound department is not difficult. Same-day appointments can be given as such scans can be performed quickly. Such a policy can also contribute to the basic ultrasound training of obstetric and gynaecology trainees. More importantly, it would allow proper scheduling of sTOP procedures during the optimal gestational periods, thus avoiding the greater rates of failed sTOP at earlier gestations. It would also prevent inadvertent sTOP of ectopic pregnancies and may allow the pre-operative diagnosis of complete and even partial hydatidiform moles.

Training and accreditation of operators

Theoretical and supervised practical training is essential before operators are allowed to perform independently. While the performance of at least 20 termination of pregnancies under supervision is often enough to ensure practical competence in most operators, the real skills to impart are the recognition of cases at high risk for complications and the inculcation of the need for consultation with senior colleagues when difficulty is encountered.

Informed consent and scheduling of sTOP

The small risk of failed sTOP should be explained to all patients prior to obtaining informed consent. Surgical TOPs by suction curettage should be scheduled between 7 to 12 weeks gestation as procedures performed during this period are associated with the lowest failure rates. If sTOPs are planned before 7 weeks gestation, the patients should be warned of the higher failure rates and measures to reduce failure rates intraoperatively should be considered, When high risk factors for failed sTOP are present, the procedure should be scheduled to be performed at least in the presence of, if not by, a senior operator.

Pre-operative cervical priming

Pre-operative prostaglandin improves the ease at cervical dilatation. Gemeprost (a prostaglandin E1 analogue) is superior to other prostaglandins such as PGF2α[14], and had been the prostaglandin of choice in sTOP. Its use should have been routine if not for its cost and side effects (mainly gastrointestinal). Most would recommend its use in the presence of risk factors for difficult cervical dilatation such as nulliparity.

In recent years, oral misoprostol has been shown to be superior to vaginal gemeprost in terms of greater cervical diliatation, better side effect profile and ease of cervical dilatation[15]. More recently, vaginal misoprostol has been shown to be slightly more effective and with much less side effects compared to oral misoprostol[16]. Misoprostol is also much cheaper than gemeprost. It has been suggested, therefore, that vaginal misoprostol should be used routinely for all sTOP. The only disadvantage is that the use of misoprostol as a cervical priming agent is neither supported nor recommended by the manufacturers.

Intraoperative measures

Bimanual examination

It is good practice for the operator to perform a bimanual vaginal examination to determine the size and flexion of the uterus before surgical cervical dilatation. An appreciation of the uterine position would reduce the risk of failed cervical dilatation.

Suction cannula

The size of suction cannula that should be chosen should be at least of a size in mm equal to, if not more than, the number of weeks of gestation.

Gross visualization of aspirate

A clear plastic hose that connects to the suction cannula allows the gross visualization of the aspirate. Clear amniotic fluid can been seen easily within the hose if the gestational sac has been ruptured although it is often admixed with blood and solid tissues. Scanty aspirate suggests a failed sTOP or incomplete abortion.

Availability of senior operator and ultrasound scan facilities

A senior operator should be available to assist in situations where difficulty is encountered. This is particularly so if difficulty is encounterd at cervical dilatation or scanty tissue is obtained. If an ultrasound scan machine is available, ultrasound-guided aspiration may be performed in these difficult cases.

Management of failed termination

Early post-operative recognition

Early recognition of a failed termination is important to initiate prompt management and limit consequences.

Gross inspection of products of conception

The gross inspection of products of conception in the unprepared fresh specimen has been shown to be of limited value as the visual identification of villi is unreliable[3].

Gross inspection with flotation technique

The aspirate can be washed in a kitchen strainer under running water to remove blood and clots, and the remaining tissue transferred into a clear glass dish containing water or sodium chloride for examination under good lighting[17]. It is important to visualise the gestational sac (extremely thin and transparent structure), villi (with white delicate frondlike projections) and decidual tissue (thicker and reddish brown in colour). It is almost possible to identify the amniotic sac in the tissue evacuated from a pregnancy of less than 10 weeks gestation (dated from the last menstrual period), and fetal parts as well in that 10 weeks gestation or more[3]. It is important to realize that a limited chorionic villi sampling can be performed with the cannula with the gestational sac remaining intact. Hence isolated finding of villi without the gestational sac is not adequate evidence of successful sTOP.

A mechanism of formal reporting of this routine inspection has allowed a 60% reduction in the rate of failed sTOP to 0.25 per 1000 procedures[3].

Ultrasound scan

In cases of scanty aspirate or aspirate without amniotic sac and/or fetal tissues, an urgent and careful ultrasound scan should be performed to confirm the diagnosis of failed sTOP. It also allows the detection of any coincident congenital uterine anomalies that may be a cause for the failed sTOP, and to guide a repeat surgical procedure.

Recognition at the routine post-operative follow-up

Routine follow-up visits of patients after termination of pregnancy allow an opportunity to detect complications (incomplete abortion, failed abortion, endometritis, perforation), and a platform for discussion of contraceptive and other women's health issues.

History and physical examination

A history of continued pregnancy symptoms (eg morning sickness) may be elicited in cases of failed sTOP. Routine vaginal examination to determine uterine size is probably not necessary unless risk factors for failed sTOP exist.

Post-TOP urine pregnancy test

We have previously studied the use of urine pregnancy test 3 weeks after uncomplicated sTOP between 7 to 12 weeks gestation (YK Lim, manuscript in preparation) and found a high false positive rate of 20%, thus limiting its usefulness in the detection of failed sTOP.

Histology

There is no agreement about the value of submitting tissue obtained at uterine curettage performed on the pregnant or recently pregnant woman for histological examination. Proponents for routine histology after termination of pregnancy suggest that it helps make an unsuspected diagnosis such as molar or ectopic pregnancy, or a surgical complication such as failed termination of pregnancy.

The preoperative detection of complete hydatidiform mole and ectopic pregnancy is good with ultrasound scan, and hence the value of routine histology for the detection of these is poor. The detection of partial hydatidiform mole which manifests as cystic spaces within the placenta may be more difficult, but is also fortunately of less consequence. For partial hydatidiform moles, there is a recurrence risk in the subsequent pregnancy of 1.7%[18], 2/3 of which are partial moles, and negligible risk of subsequent development of choriocarcinoma. Products of conception have been found in histology reports of cases with failed sTOP. Products of conception were not confirmed in 5% of surgical terminators[19], all of whom recovered well without complications. Such patients would have gone through unnecessary investigations and anxiety. Hence the arguments for routine histology for sTOP are weak at best.

Ultrasound scan

Routine ultrasound scan for the screening of failed sTOP at the follow-up visit is not cost-effective. Ultrasound scan provides a definitive diagnosis of failed sTOP, and should be performed if there are suspicions of this diagnosis based on the presence of risk factors, difficult intraoperative procedure or upon clinical suspicion at follow-up.

Counselling

The patient must be fully informed of the problem, the reasons why it may have occurred and the options available. Termination of pregnancy will have to be offered. A small minority may choose to continue with the pregnancy. The fetal complications that have been associated with continuation of pregnancy after a failed suction curettage are limb defects, including arthrogryposis, and Mobius' syndrome[20]. These have to be explained clearly and carefully to the patient.

Termination of pregnancy

This can be achieved by medical or surgical procedures. Medical termination of pregnancy should be considered if gestation is more than 12 to 14 weeks, or if a difficult surgical procedure is

anticipated (e.g. previous difficult surgical cervical dilatation despite pre-operative prostaglandin, or congenital uterine anomaly with difficult access to gestation sac).

For repeat surgical procedures, preoperative prostaglandin should be administered and it should be rescheduled to be performed by a senior operator with or without ultrasound guidance. If the pregnancy is less than 7 weeks gestation, it should be rescheduled to 7 to 12 weeks gestation. If the pregnancy is more than 12 to 14 weeks gestation, dilatation and evacuation may be offered if the operator is experienced and comfortable with the procedure. If cervical perforation had occurred, rescheduling the procedure 1 week later may allow healing of the false passage in the cervix.

CONCLUSION

Failed sTOP is uncommon but has serious consequences. The strongest risk factor for failed sTOP is that of congenital uterine anomalies. Examination of the aspirated tissue under the flotation method has been shown to be useful strategy for the early detection of failed sTOPs.

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